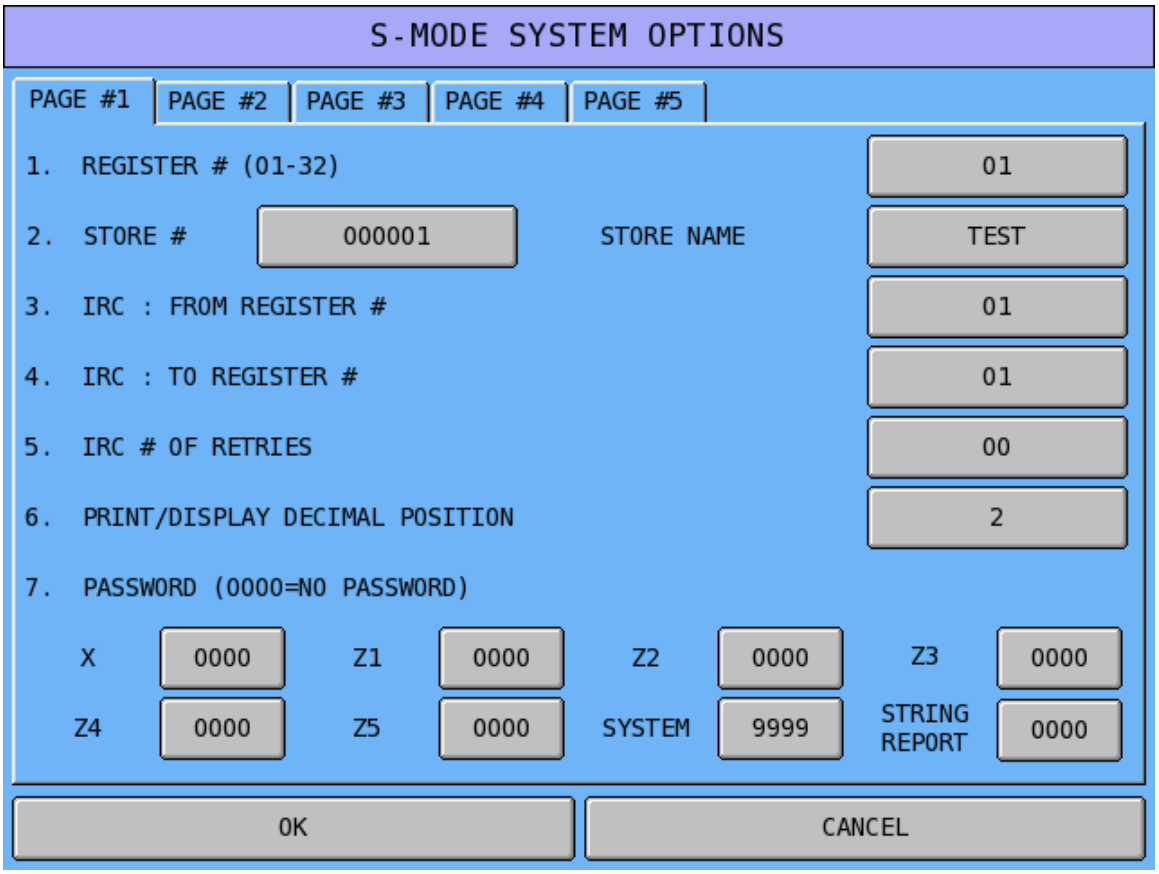
PC/POLL SYSTEMS
Version 7 Polling
SPS2000 Cash Register
TCP/IP Communications

PC/POLL SYSTEMS supports native TCP/IP polling for the SPS2000 cash register. It is recommended users have the register updated to ROM 2.02k or above and the software to version 7.1.1.449 or above. Detailed below are the setup instructions. Prior to beginning, please verify both the Polling build number and register ROM version to insure communications.

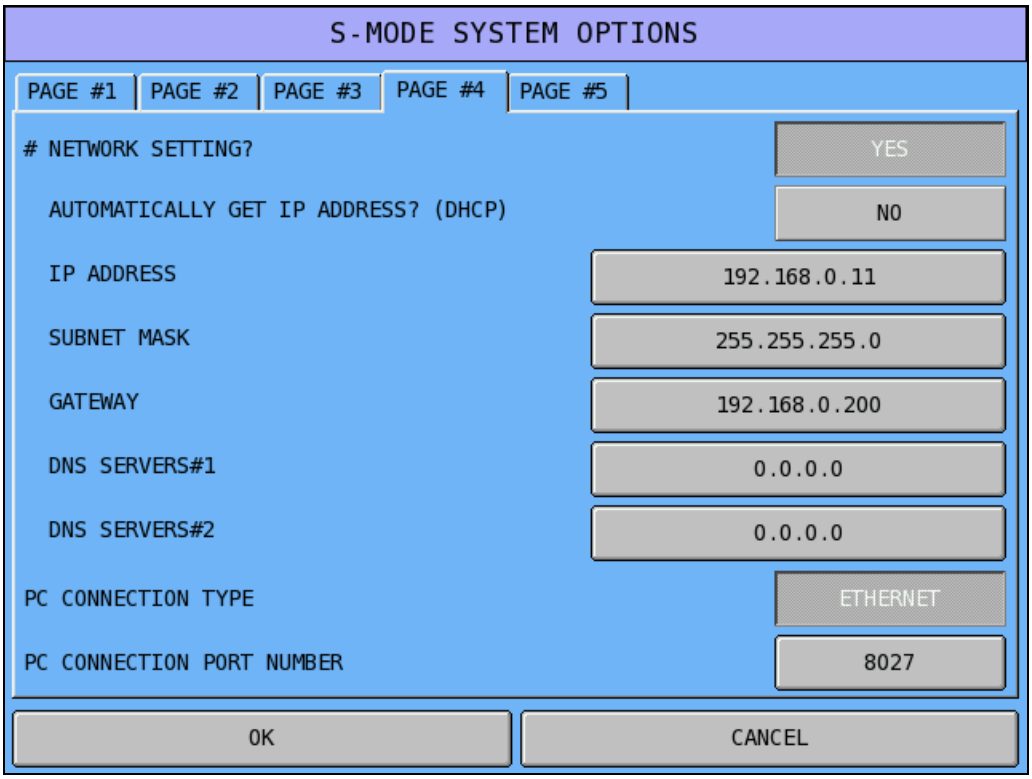
Register Setup
On the register side, users should begin by configuring basic S Mode parameters such as Register Number, Store Number and IRC range. Prior to all Polling communications, these options must be set at the register. Other S Mode options on pages 2, 3 and 5 should be set as needed.

Below is a sample image from the cash register.



On Page 4 of S-Mode, users will need to program a few additional options for TCP/IP communications. The options will vary based upon the network settings of the system and the location of the PC. A LAN (Local Area Network) is generally a connection made within one geographic location, such as an office network. A WAN (Wide Area Network) is generally a connection made across a larger distance, such as across two different US states using the Internet. The SPS2000 and PC/POLL support both types of connections, however, for more information on your network, please consult your IT administrator.

Below is a sample screen from a register that was setup for TCP/IP communications on a LAN.

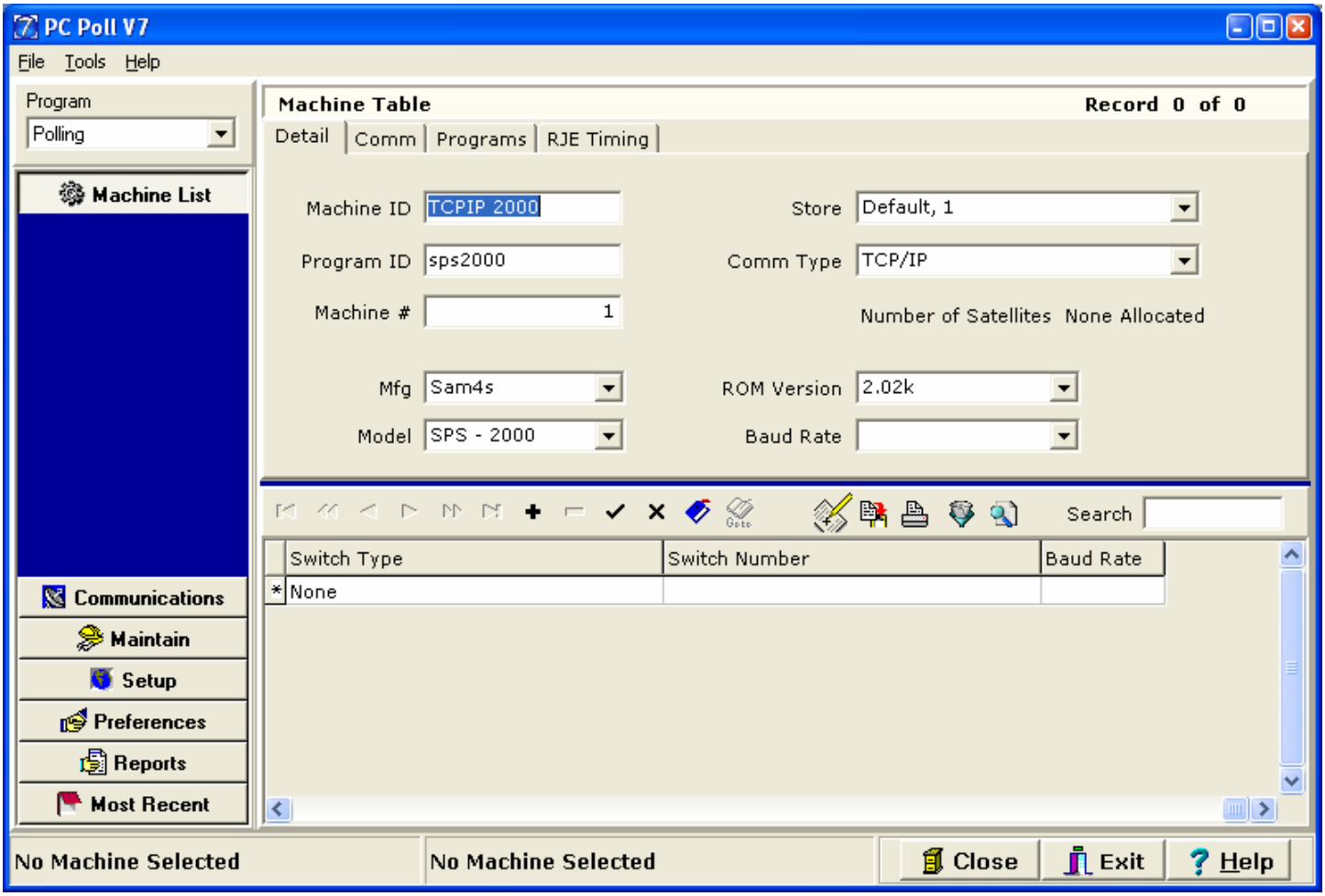


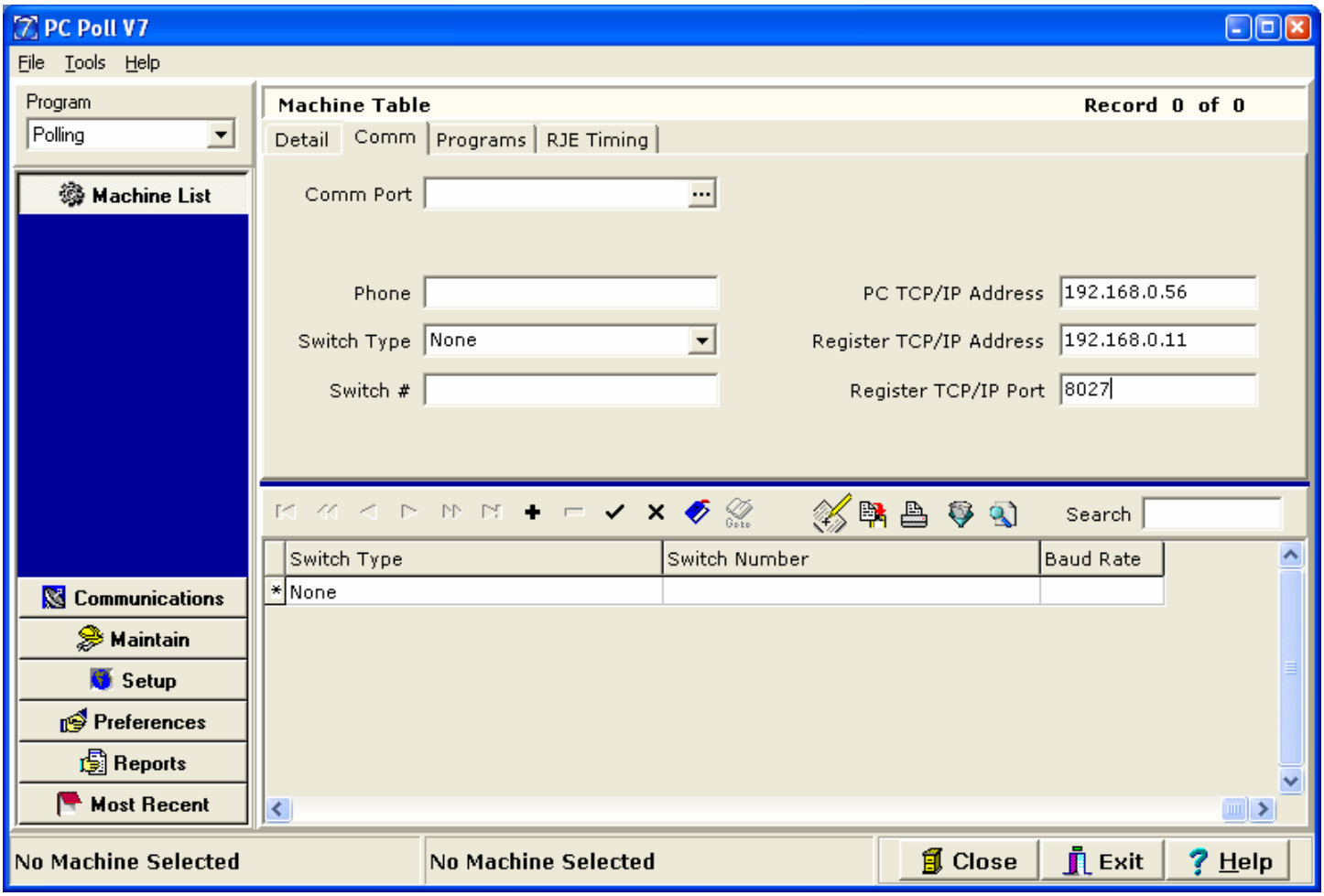
Register Fields:

# Network Setting	Should be enabled if an IP address needs to be entered manually. (The software has been tested with and without this option set to YES. If set to NO, a master register defaults to an IP address of 192.168.000.011, satellite 1 to 192.168.000.012, etc.)
Automatically Get IP Address (DHCP)	If the network is using a DHCP server the server will automatically assign an IP address to the cash register. Please consult your IT administrator.
IP Address	The IP address of the cash register. This field must be manually populated with an address. Please consult your IT administrator for a list of available IP address.
Subnet Mask	A series of numbers that designates the size or range of available host ID numbers within a network. Please consult your IT administrator for this number.
Gateway	Is an access point on a computer network. In most cases it is the internal IP address of your router or, usually, the first IP address of your network. Please consult your IT administrator for this number.
DNS Server #1	The IP address of a domain name server. Please consult your IT administrator for this number.
DNS Server #2	A backup address for DNS Server #1. Please consult your IT administrator for this number.
PC Connection Type	For TCP/IP communications this must be set to Ethernet. For serial communications, please

	set this option to Serial.
PC Connection Port Number	In order to direct communications to a TCP/IP register, the register needs a port number. This number is also used in WAN communications by the router. The router must be programmed to forward transmissions that are incoming on the specified port number to the register's IP Address. 8027 is the default port number.

Software Setup
The following two images are the software screens necessary for making a LAN connection to the machine pictured above.





Within the software, users simply create a machine (similar to serial communications), with the following options set:

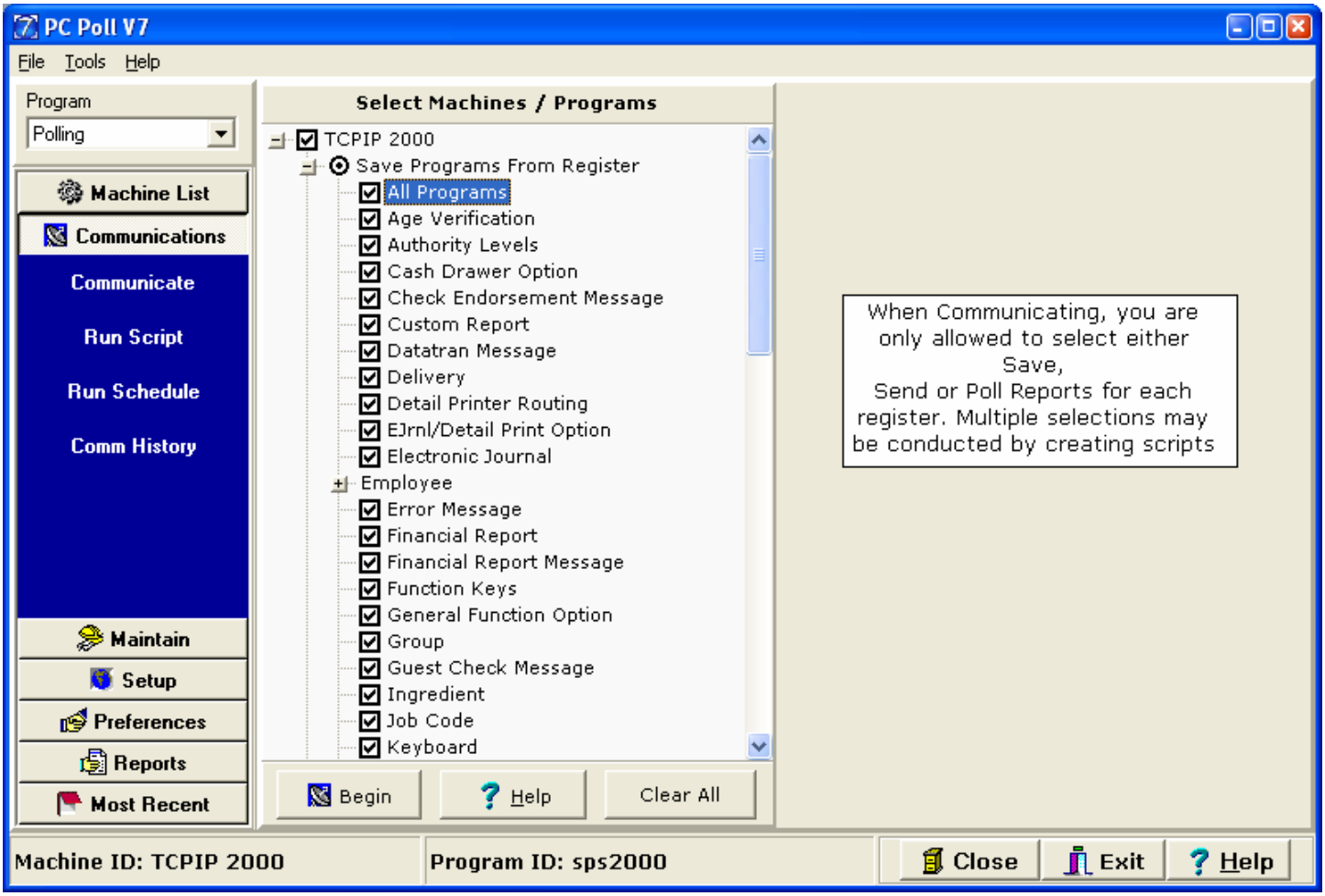
Software Fields:

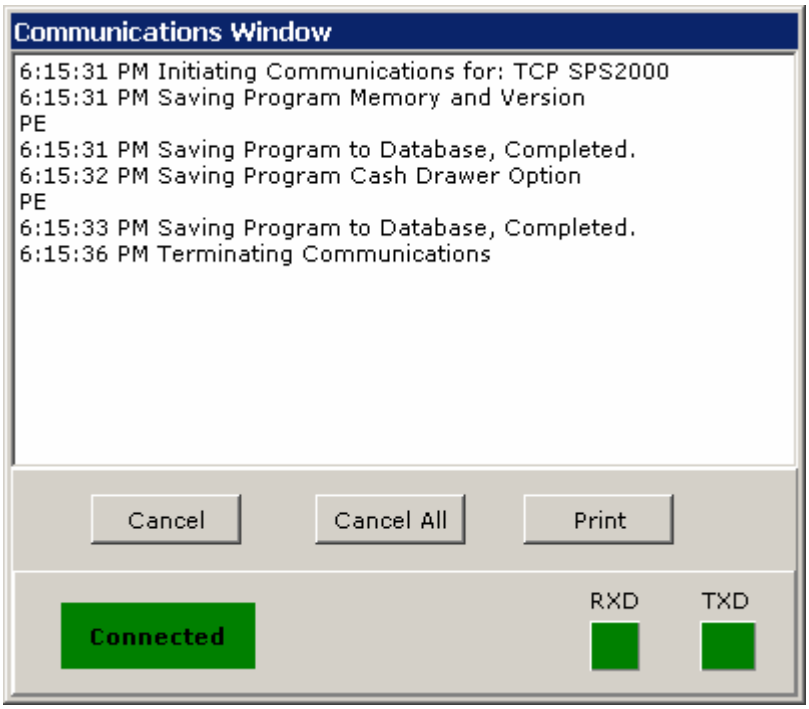
Machine ID	A user defined name for the machine.
Program ID	A user defined name for the database files.
Machine #	This number must match the Register Number within the cash register.
Mfg	Sam4s
Model	SPS – 2000
Store	Select a previously created store that corresponds with the programmed Store Number within the cash register.
Comm Type	TCP/IP
ROM Version	2.02K or above
Baud Rate	N/A (Only needed for serial communications.)
Comm Port	N/A (Only needed for serial communications.)
Phone	N/A (Only needed for serial communications via modem.)
Switch Type	N/A (Only needed for serial communications via a switchbox.)
Switch #	N/A (Only needed for serial communications via a switchbox.)
PC TCP/IP Address	The IP address of the communicating PC. Please consult your IT administrator for this number; or, from a command prompt, enter IPCONFIG. The screen will display the IP address as well as additional network settings.
Register TCP/IP Address	The IP address of the cash register. This

	address will depend upon previously programmed S Mode settings at the cash register.
Register TCP/IP Port	8027 is the default port setting; however it is programmable by the user. It will depend upon previously programmed S Mode settings at the cash register.

After the register is programmed and the software is configured, simply enter the Communications area of Version 7 Polling.

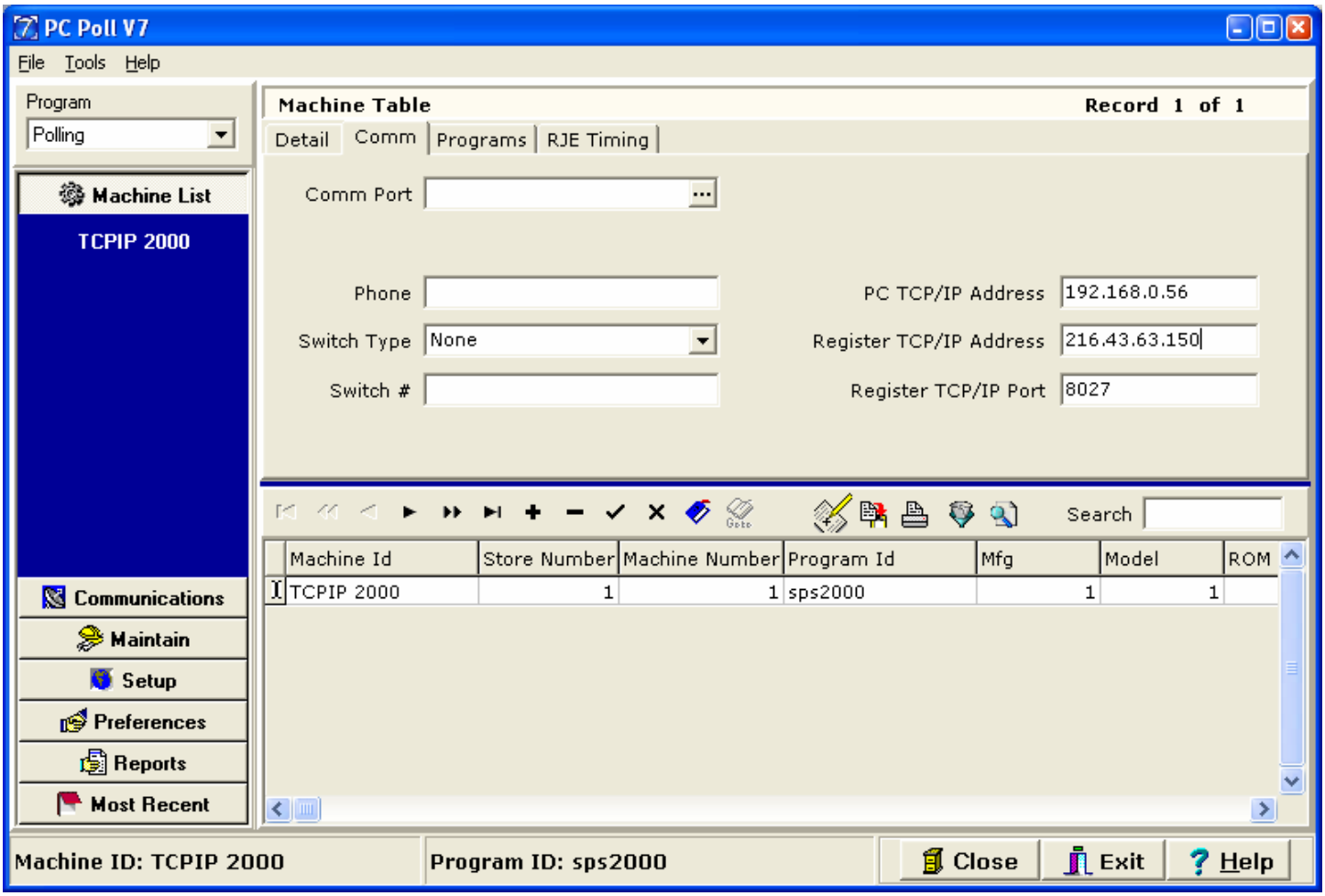
1. Select the newly created machine.
2. Choose Save Programs From Register.
3. Check the All Programs option.
4. Click the Begin button.




Communications Window
6:15:31 PM Initiating Communications for: TCP SPS2000
6:15:31 PM Saving Program Memory and Version
PE
6:15:31 PM Saving Program to Database, Completed.
6:15:32 PM Saving Program Cash Drawer Option
PE
6:15:33 PM Saving Program to Database, Completed.
6:15:36 PM Terminating Communications
Cancel
Cancel All
Print
Connected
RXD
TXD

General Notes on WAN Polling:

The SPS2000 supports LAN and WAN connections both over a cabled network and wireless. For WAN communications users should take note that additional hardware may be needed and may require additional configuration. The router will need to be configured to port forward on the register's PC Connection Port (default 8027) to the programmed IP address of the register. Within the Polling software, the register address field should be populated with the external IP address of the router on the cash register side of the installation. This address must be a static IP address. See the software image below. In the example below, the register IP address is still 192.168.0.11, however, the external (static) router IP address is 216.43.63.150. Within the router a port forward option was setup to send all incoming requests on port 8027 to the register's IP address of 192.168.0.11.

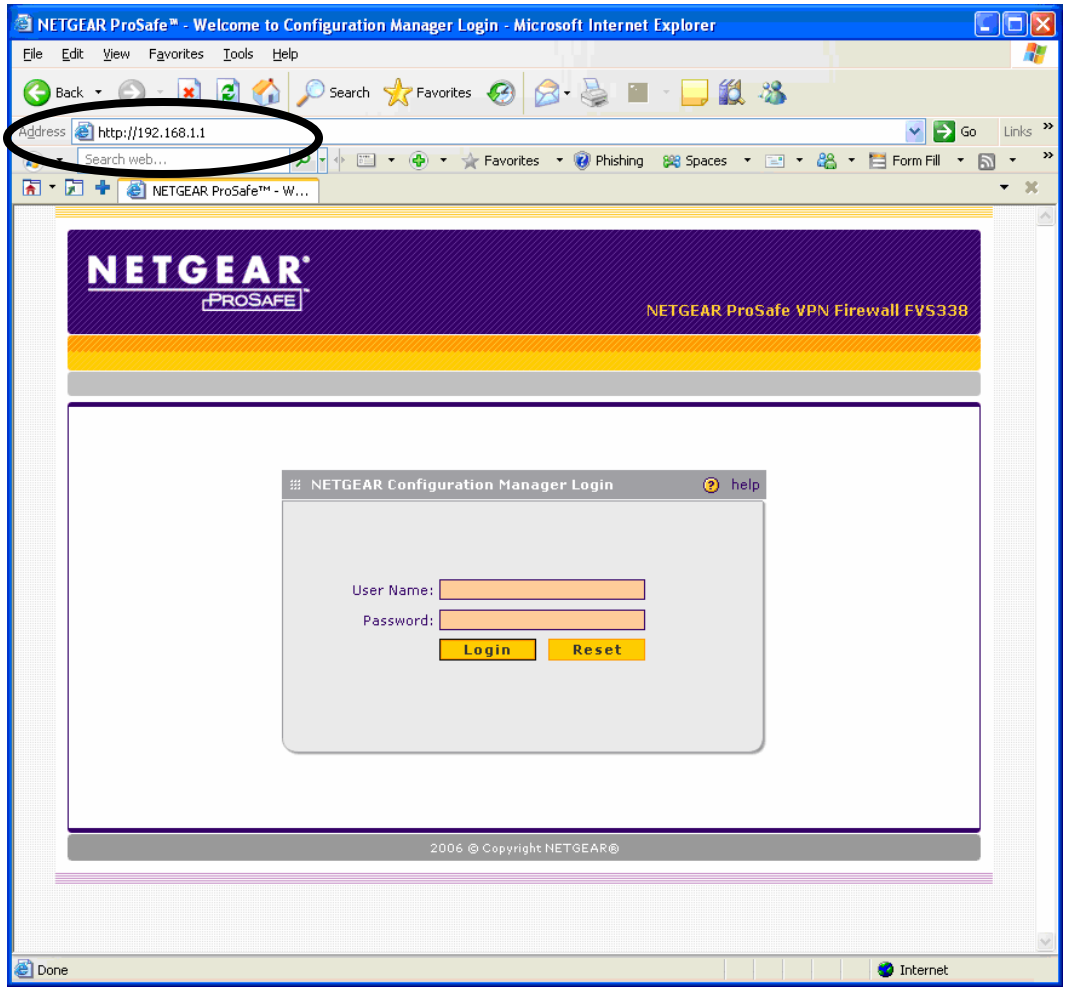


Setting up the router for WAN communications can be time consuming. If the customer does not have an IT administrator that can complete the task, it is recommended that dealers buy and install a router they know how to configure. CRS (www.crs-usa.com) does sell a Netgear router. Below are instructions, from CRS, on configuring that router to work with an SPS2000 via WAN polling. For more information, support or to purchase the router, please contact CRS directly. The instructions below are included as a general guideline on router setup.

Netgear Router Setup

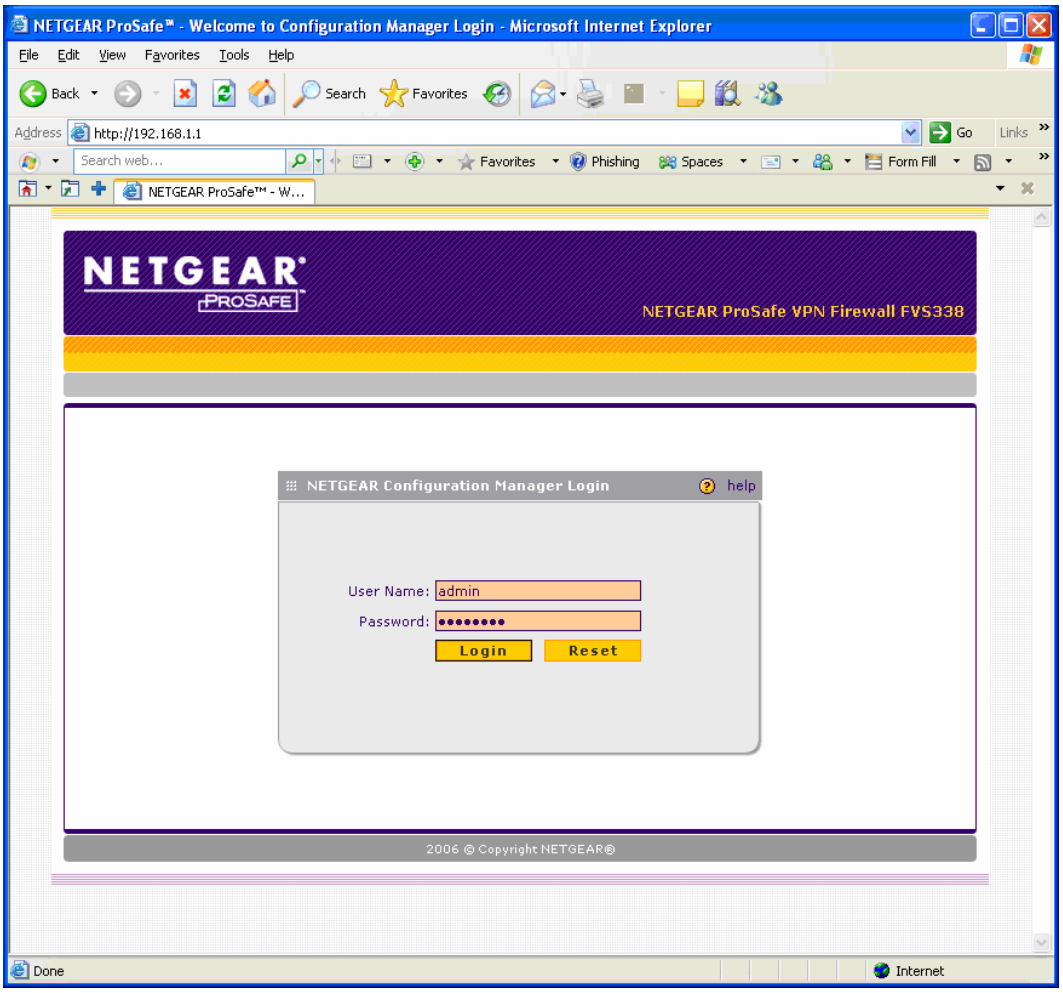
Before you begin, be sure you have the configuration parameters from your ISP handy.

1. Log in to the Router. Use a browser like Internet Explorer or Netscape to connect to http://192.168.1.1

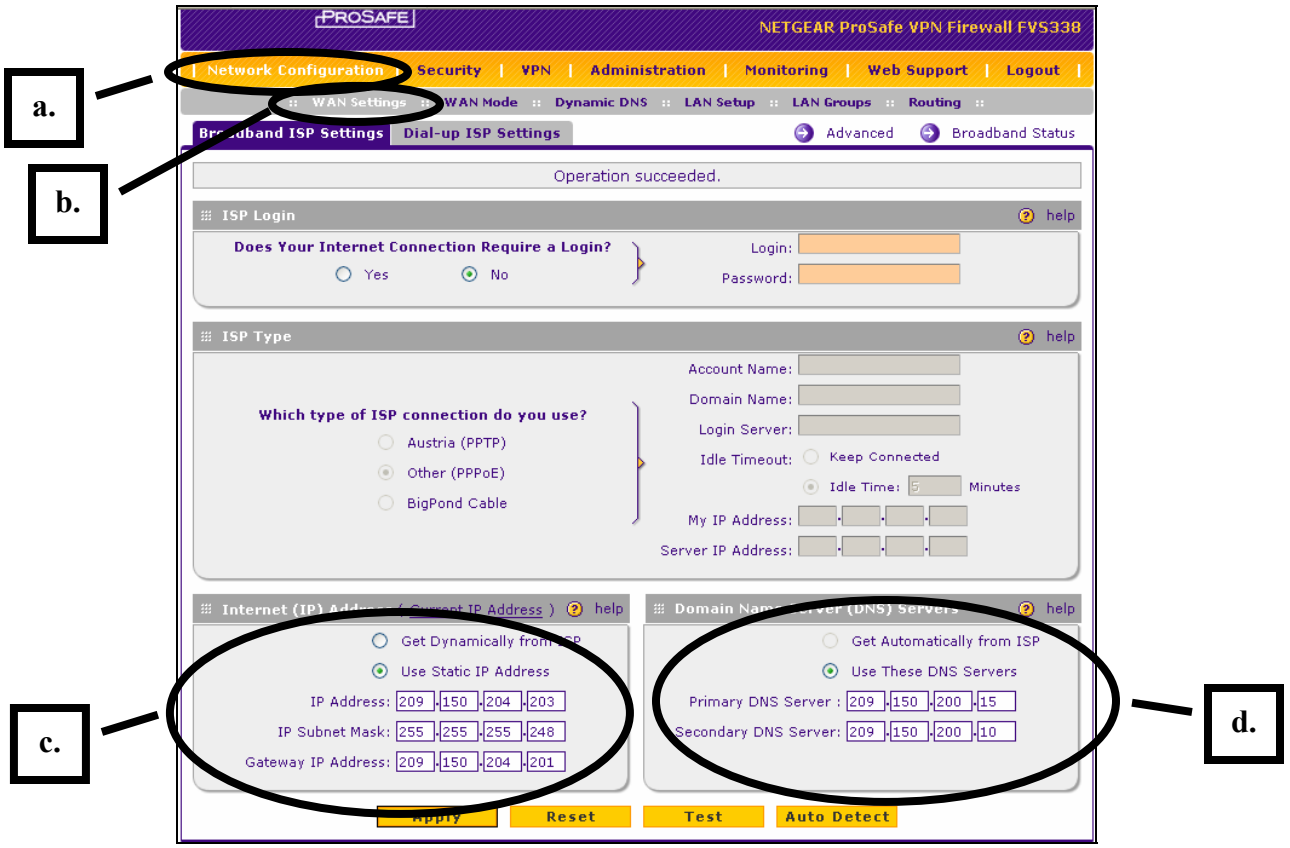


2. Log in:

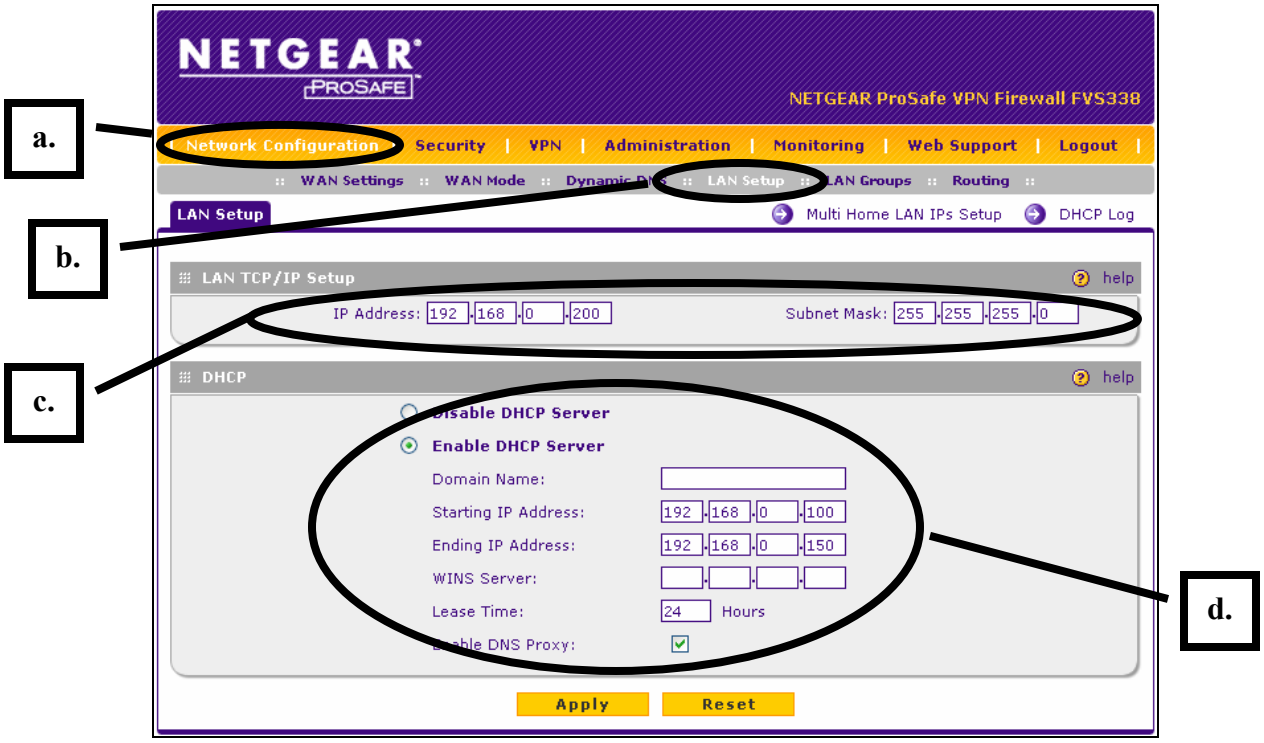
   Use the default user name: "**admin**"
   Use the default password "**password**"



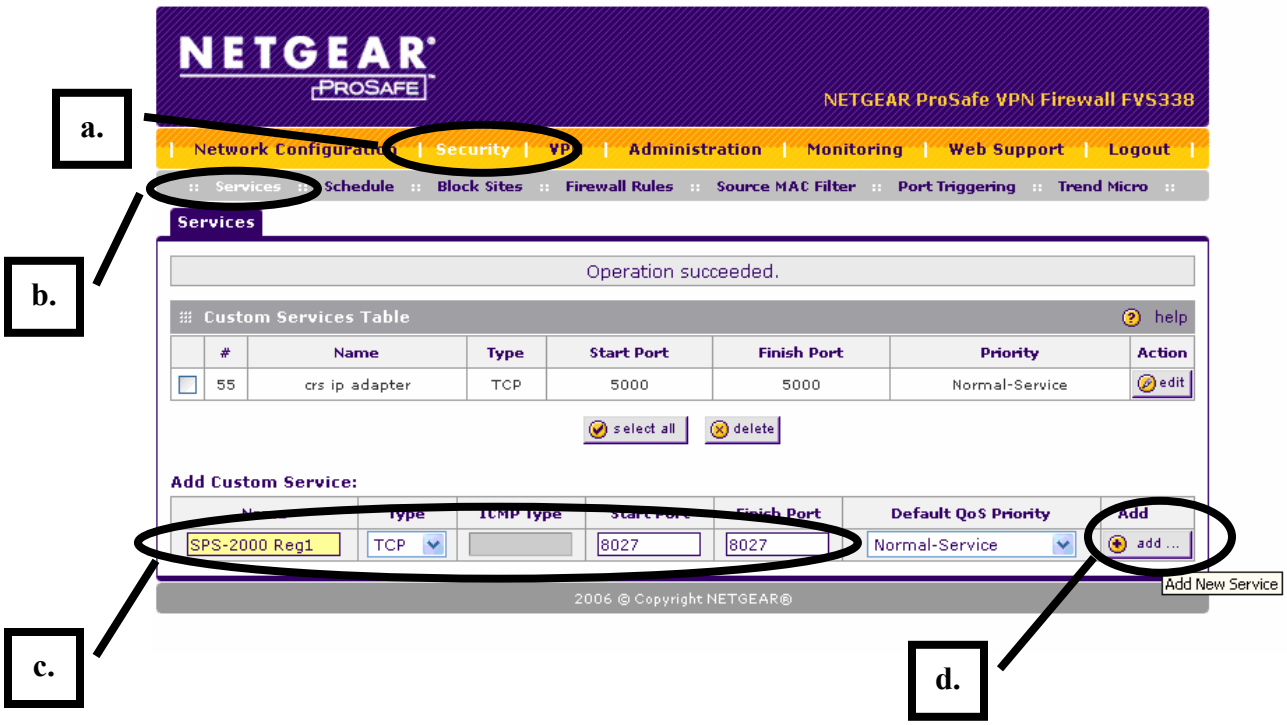
3. From the NETGEAR application:
    a. Click **Network Configuration**.
    b. Click **WAN Settings**.
    c. Enter Static IP Address information, as supplied by your ISP.
    d. Enter DHS Server information, as supplied by your ISP.



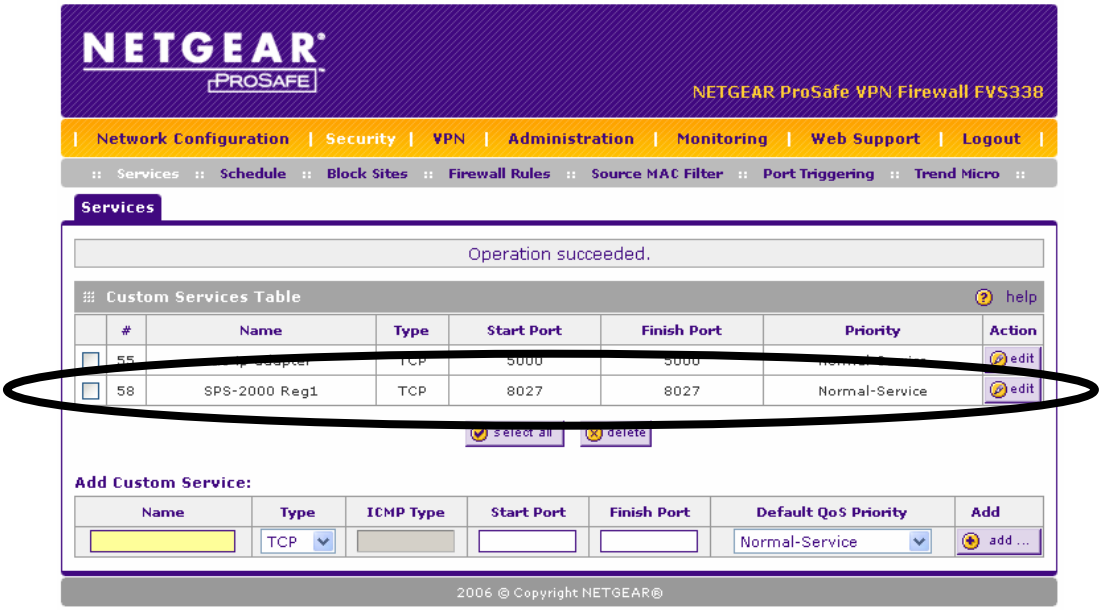
4. From the NETGEAR application:
    a. Click **Network Configuration**.
    b. Click **LAN Setup**.
    c. Enter:
        IP Address **192.168.0.200**
        Subnet Mask **255.255.255.0**
    d. Enable DHCP Server:
        Starting IP Address **191-168-0-100**
        Ending IP Address **192-168-0-150**
        This is mandatory when using IPTran/IPEnabler connected to the same router.



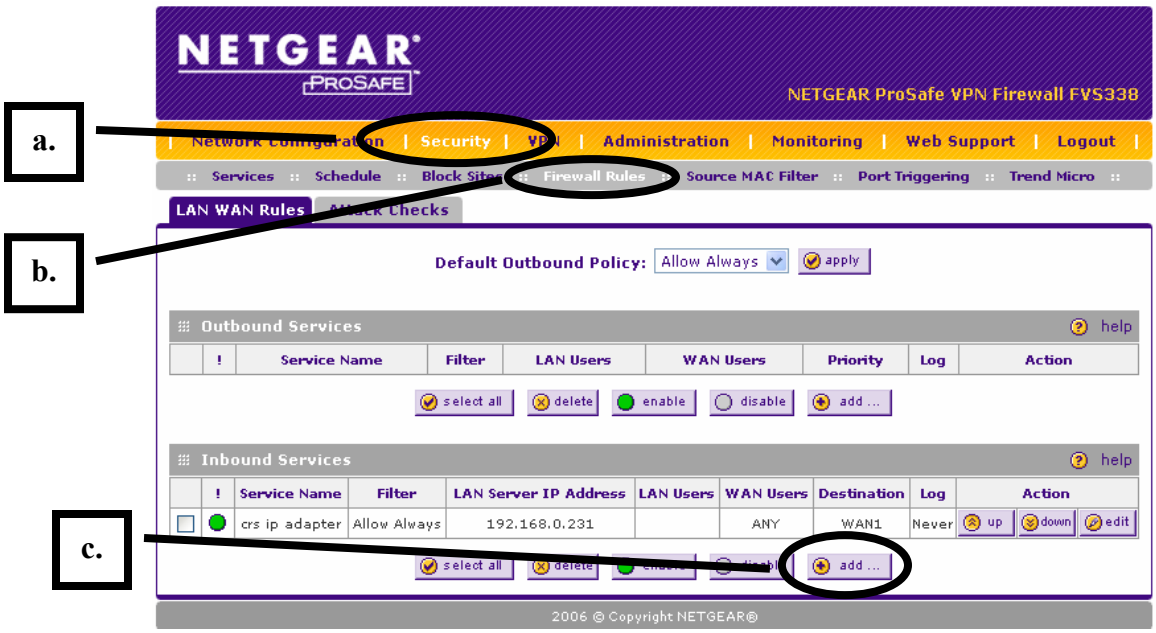
5. From the NETGEAR application:
    a. Click **Security**.
    b. Click **Services**.
    c. Enter: Descriptor (Name)/Type/Start Port/Finish Port
    Note: Port must match register port assignment
    d. Click **Add**.


a.
b.
c.
d.
NETGEAR
PROSAFE
NETGEAR ProSafe VPN Firewall FVS338
Network Configuration | Security | VPN | Administration | Monitoring | Web Support | Logout
Services :: Schedule :: Block Sites :: Firewall Rules :: Source MAC Filter :: Port Triggering :: Trend Micro
Services
Operation succeeded.
Custom Services Table
help
Name Type Start Port Finish Port Priority Action
55 crs ip adapter TCP 5000 5000 Normal-Service edit
select all
delete
Add Custom Service:
Type ICMP Type Start Port Finish Port Default QoS Priority Add
SPS-2000 Reg1 TCP 8027 8027 Normal-Service add ...
Add New Service
2006 © Copyright NETGEAR®

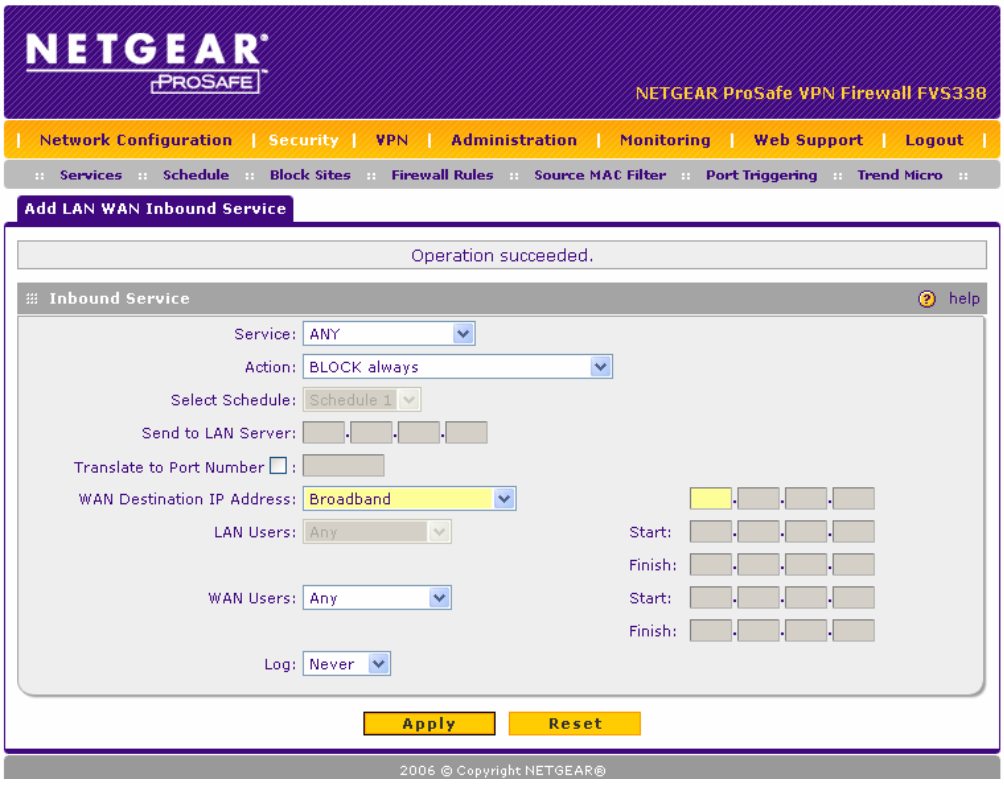
6. You can see the service in now added.


NETGEAR
PROSAFE
NETGEAR ProSafe VPN Firewall FVS338
Network Configuration | Security | VPN | Administration | Monitoring | Web Support | Logout
:: Services :: Schedule :: Block Sites :: Firewall Rules :: Source MAC Filter :: Port Triggering :: Trend Micro ::
Services
Operation succeeded.
Custom Services Table
help
Name Type Start Port Finish Port Priority Action
58 SPS-2000 Reg1 TCP 8027 8027 Normal-Service edit
select all
delete
Add Custom Service:
Name Type ICMP Type Start Port Finish Port Default QoS Priority Add
TCP
Normal-Service
add ...
2006 © Copyright NETGEAR®

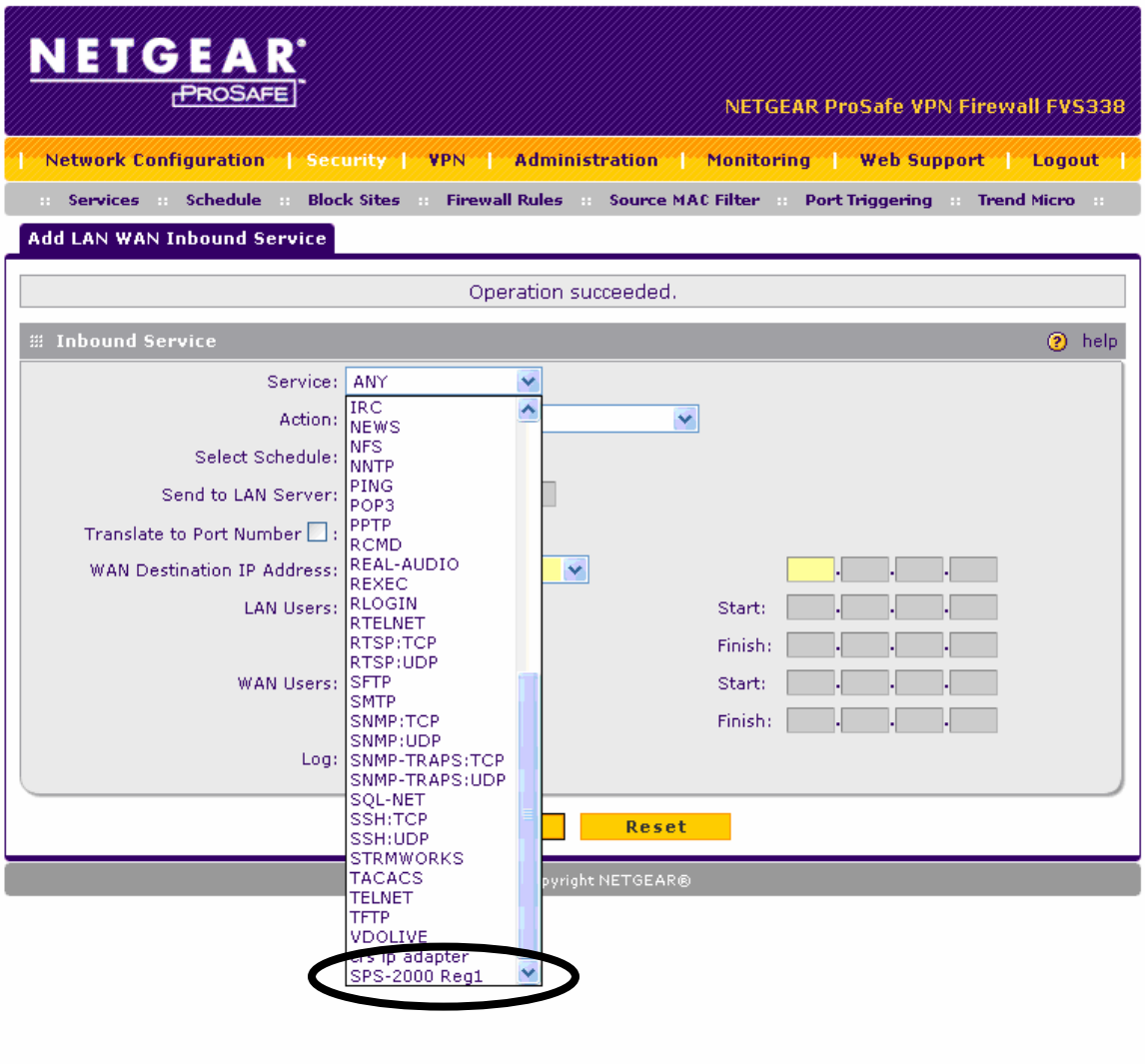
7. From the NETGEAR application:
    a. Click **Security**.
    b. Click **Firewall Rules**.
    c. Click **Firewall Add**.


a.
b.
c.
NETGEAR
PROSAFE
NETGEAR ProSafe VPN Firewall FVS338
Network Configuration | Security | VPN | Administration | Monitoring | Web Support | Logout
Services :: Schedule :: Block Sites :: Firewall Rules :: Source MAC Filter :: Port Triggering :: Trend Micro
LAN WAN Rules
Default Outbound Policy: Allow Always apply
Outbound Services help
! Service Name Filter LAN Users WAN Users Priority Log Action
select all delete enable disable add ...
Inbound Services help
! Service Name Filter LAN Server IP Address LAN Users WAN Users Destination Log Action
crs ip adapter Allow Always 192.168.0.231 ANY WAN1 Never up down edit
select all delete add ...
2006 © Copyright NETGEAR®

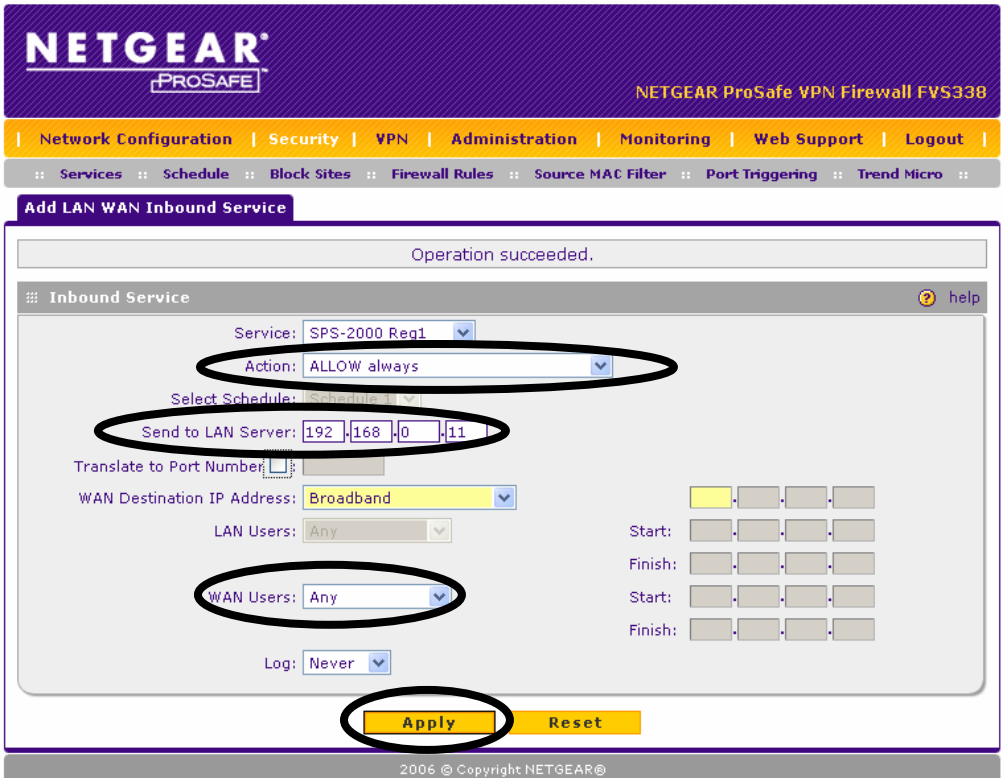
8. You will view this screen:


NETGEAR
PROSAFE
NETGEAR ProSafe VPN Firewall FVS338
Network Configuration | Security | VPN | Administration | Monitoring | Web Support | Logout
Services :: Schedule :: Block Sites :: Firewall Rules :: Source MAC Filter :: Port Triggering :: Trend Micro
Add LAN WAN Inbound Service
Operation succeeded.
Inbound Service help
Service: ANY
Action: BLOCK always
Select Schedule: Schedule 1
Send to LAN Server:
Translate to Port Number :
WAN Destination IP Address: Broadband
LAN Users: Any Start: Finish:
WAN Users: Any Start: Finish:
Log: Never
Apply Reset
2006 © Copyright NETGEAR®

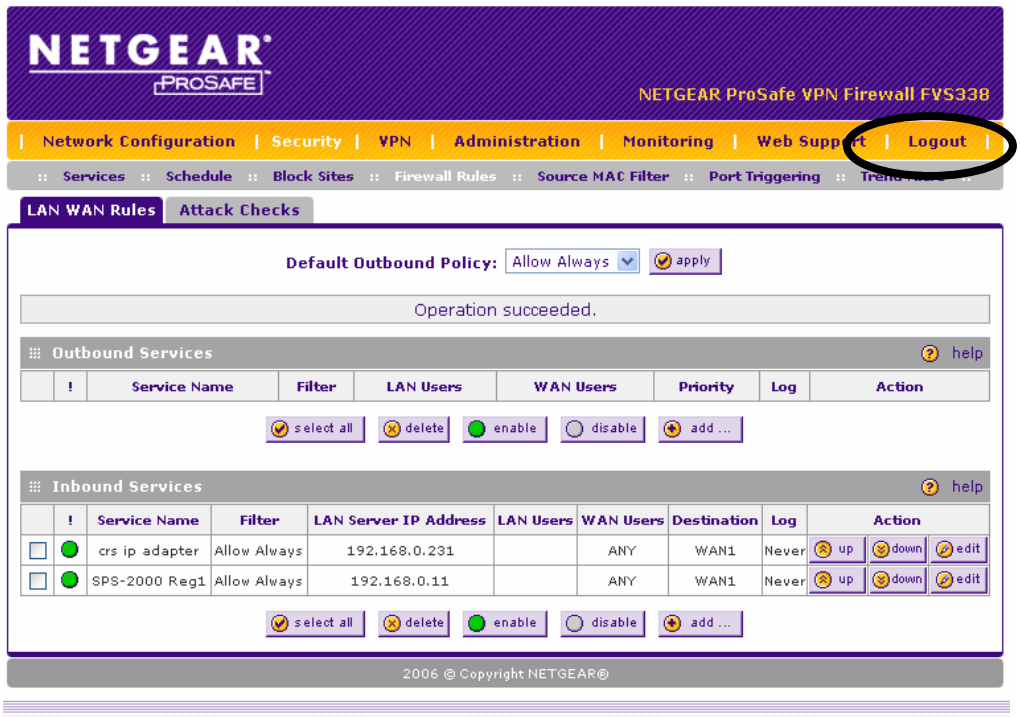
9. From the **Service** drop-down box, select the service added previously.



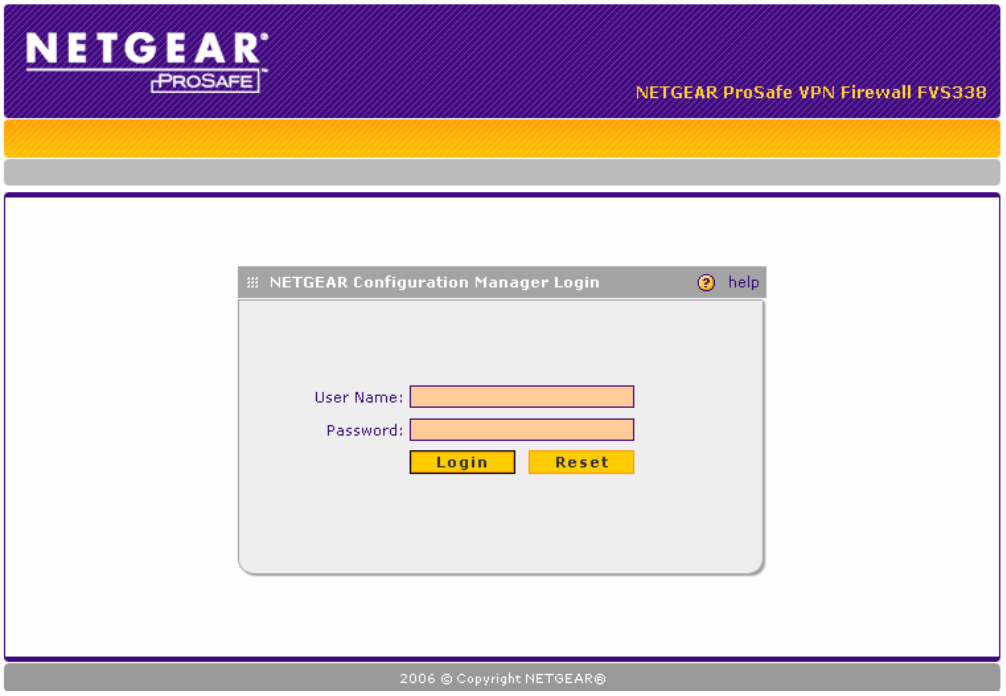
10. Complete the settings shown below:
    Note that the network setting in the "Send to LAN Server" field must match the network settings set within S-Mode System Options.
11. Click **Apply**.



12. You will see the added service.


NETGEAR
PROSAFE
NETGEAR ProSafe VPN Firewall FVS338
Network Configuration | Security | VPN | Administration | Monitoring | Web Support | Logout
Services :: Schedule :: Block Sites :: Firewall Rules :: Source MAC Filter :: Port Triggering ::
LAN WAN Rules
Attack Checks
Default Outbound Policy: Allow Always apply
Operation succeeded.
Outbound Services
help
! Service Name Filter LAN Users WAN Users Priority Log Action
select all delete enable disable add ...
Inbound Services
help
! Service Name Filter LAN Server IP Address LAN Users WAN Users Destination Log Action
crs ip adapter Allow Always 192.168.0.231 ANY WAN1 Never up down edit
SPS-2000 Reg1 Allow Always 192.168.0.11 ANY WAN1 Never up down edit
select all delete enable disable add ...
2006 © Copyright NETGEAR®

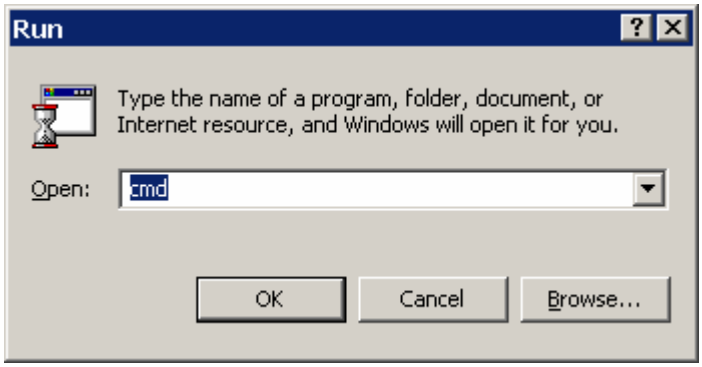
13. Click Logout. The application closes and the settings are complete.



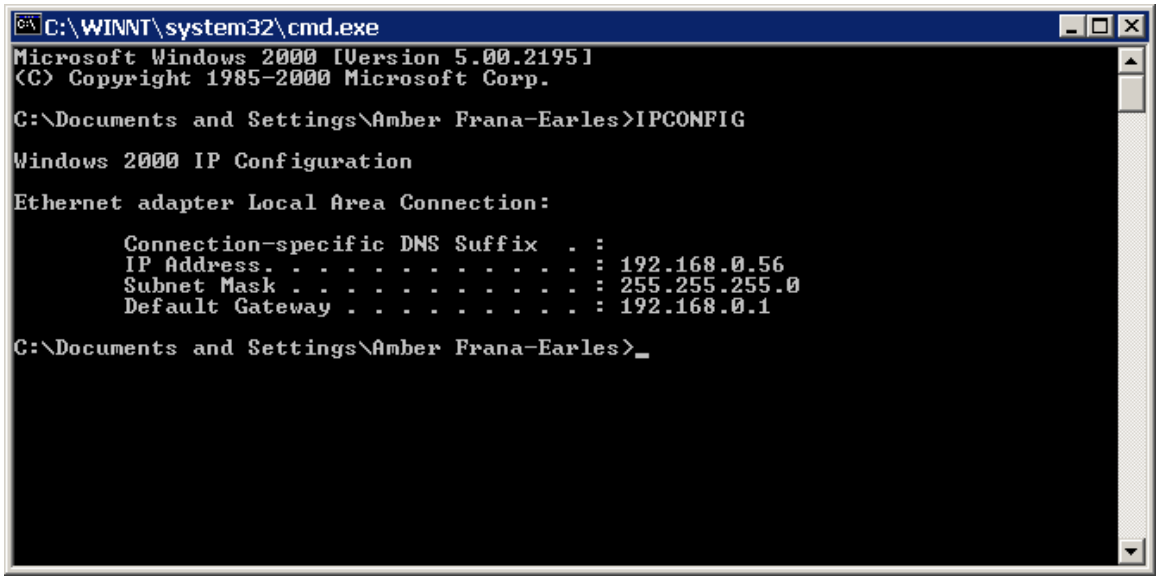
Helpful Hints and Suggestions:

Hint #1: Finding the IP address of a PC

1. Click on Windows Start button.
2. Locate and select the Run option.
3. From the Run menu type ‘cmd’ and click OK.

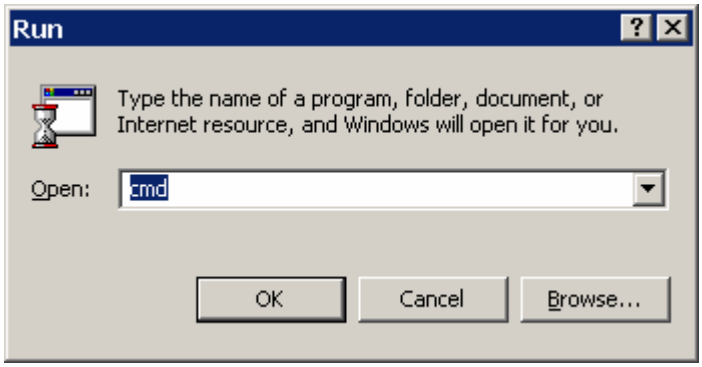


4. Within the command screen type IPCONFIG and hit the Enter key.
5. The screen will display your network information.


C:\WINNT\system32\cmd.exe
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.
C:\Documents and Settings\Amber Frana-Earles>IPCONFIG
Windows 2000 IP Configuration
Ethernet adapter Local Area Connection:
Connection-specific DNS Suffix . :
IP Address. . . . . : 192.168.0.56
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.0.1
C:\Documents and Settings\Amber Frana-Earles>

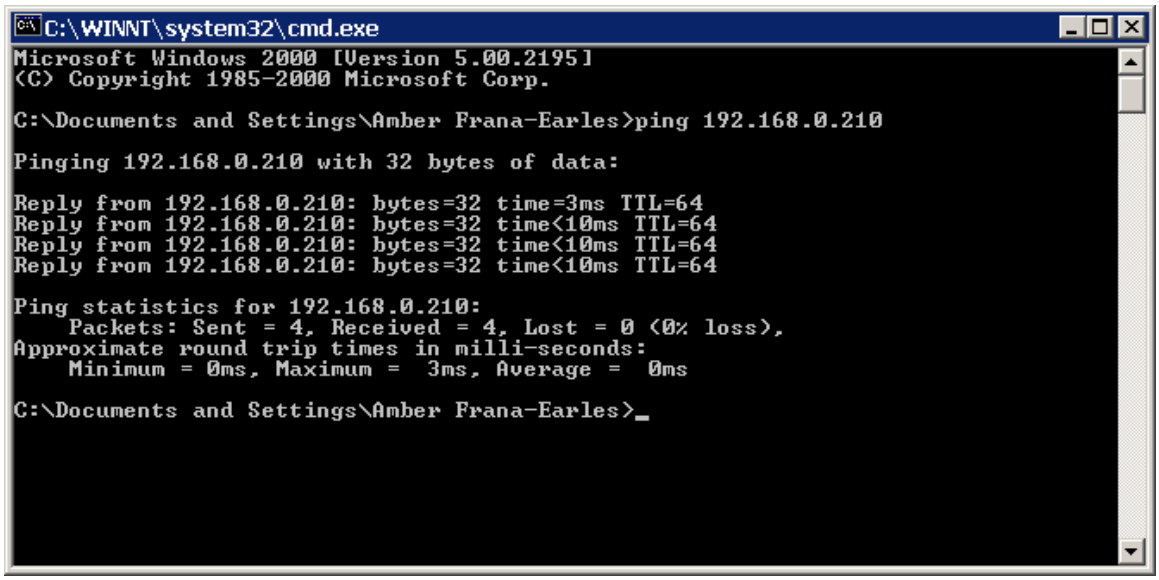
Hint #2 Ping the cash register
In order to ensure there is a connection between the register and PC it is strongly recommended that users PING the cash register prior to attempting polling communications. (This is for LAN communications only.)

1. Click on Windows Start button.
2. Locate and select the Run option.
3. From the Run menu type 'cmd' and click OK.

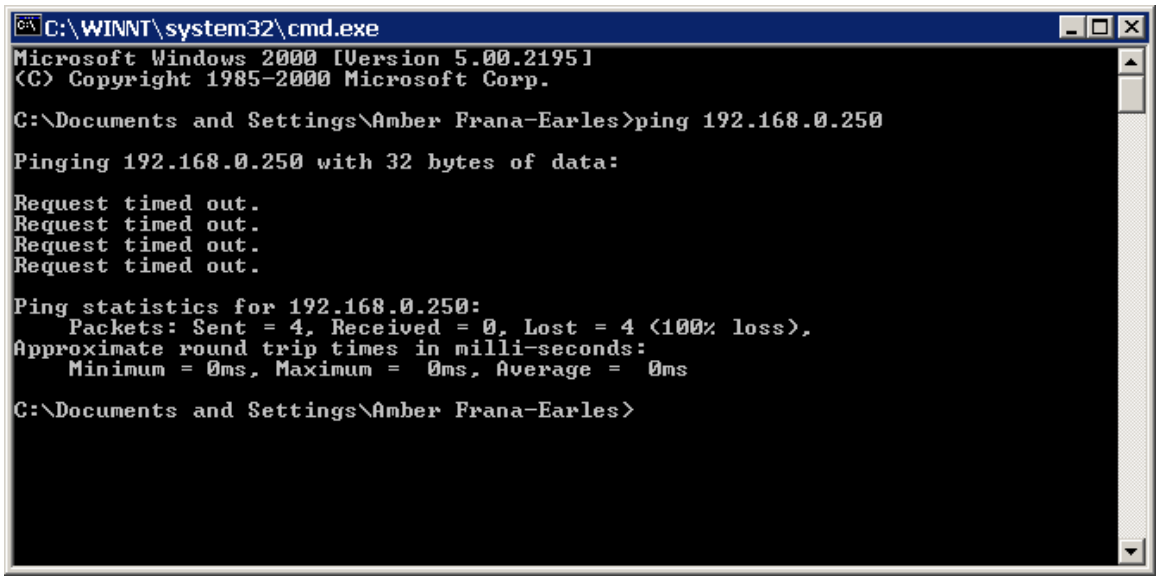


4. On the command screen type 'ping' followed by the IP address of the cash register. If the register is connected correctly, it should reply; or else the request will time out.

Correct Connection


C:\WINNT\system32\cmd.exe
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.
C:\Documents and Settings\Amber Frana-Earles>ping 192.168.0.210
Pinging 192.168.0.210 with 32 bytes of data:
Reply from 192.168.0.210: bytes=32 time=3ms TTL=64
Reply from 192.168.0.210: bytes=32 time<10ms TTL=64
Reply from 192.168.0.210: bytes=32 time<10ms TTL=64
Reply from 192.168.0.210: bytes=32 time<10ms TTL=64
Ping statistics for 192.168.0.210:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 3ms, Average = 0ms
C:\Documents and Settings\Amber Frana-Earles>

Error Connecting

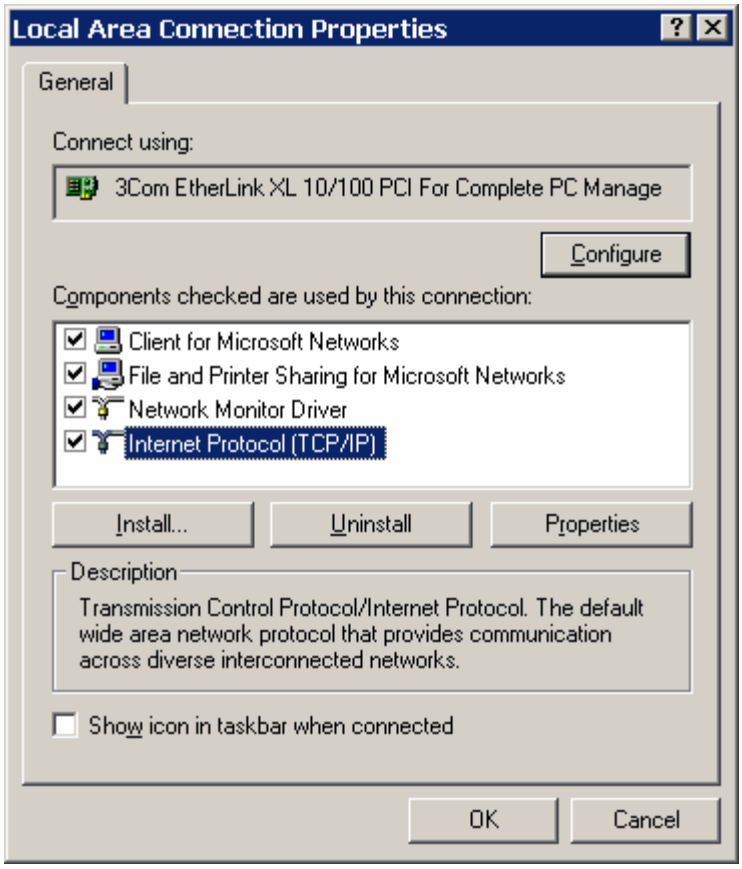

C:\WINNT\system32\cmd.exe
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.
C:\Documents and Settings\Amber Frana-Earles>ping 192.168.0.250
Pinging 192.168.0.250 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 192.168.0.250:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\Documents and Settings\Amber Frana-Earles>

Hint #3 Quick and easy register setup
The simplest way to configure the SPS2000 for TCP/IP communications is to setup all S Mode settings as usual for a serial connection, except change the PC Connection Type from Serial to Ethernet and set the PC Connection Port to 8027. There is no need to set any other fields within S Mode, page 4, they will be set automatically by the register. The default IP address of a master register is 192.168.0.11. The IP addresses increase by one for each satellite i.e. satellite number 1 is 192.168.0.12. (Note: This setup is for a network with a subnet mask of 255.255.255.0 and gateway 192.168.0.1. If other settings are needed, please follow the complete setup as detailed above.)

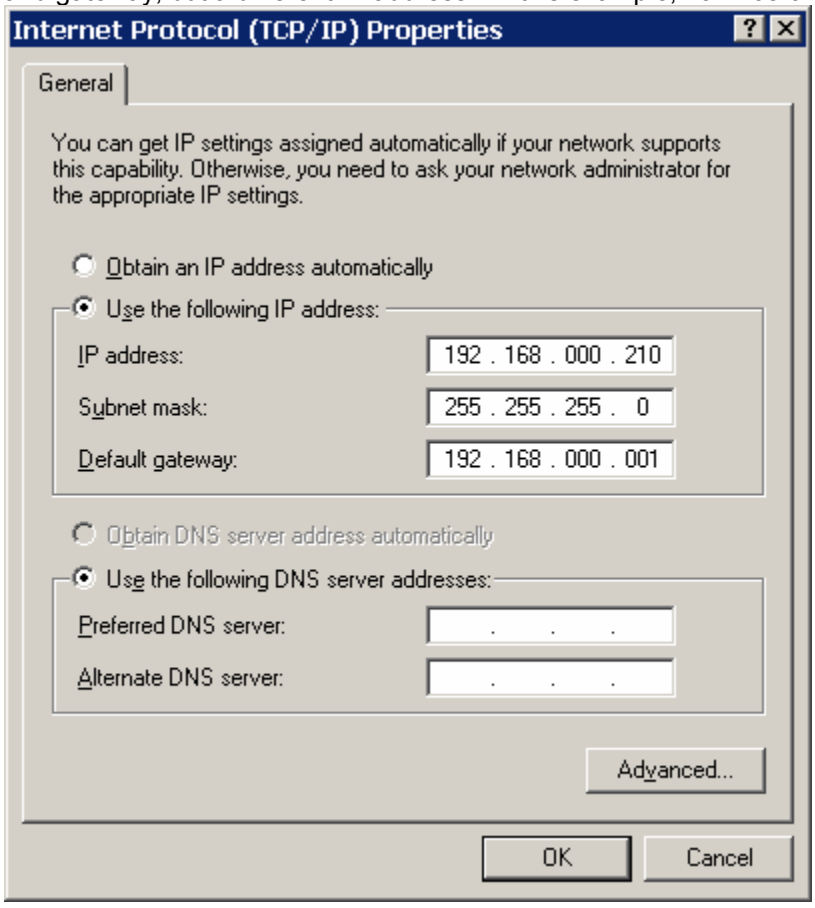
Then simply, connect the register to your network. In most LAN configurations the register and PC will require a standard network cable, connected to a network router/hub/RJ45 network jack.

Hint #4 PC and register crossover connection
The communications connection can also be made directly between PC and the register using a crossover cable. This would be a connection between 1 PC and 1 register. The register could not be part of an IRC. The PC will not be able to connect to a network or the Internet. In this situation, additional network settings may be required on the PC, such as programming an IP address. Please consult your IT administrator. Below is a sample PC setup, configurations may vary.

1. Open the control panel.
2. Select Network and Dial-up Connections.
3. Right-click Local Area Connection.
4. Choose Properties.
5. Select Internet Protocol (TCP/IP).



6. Click on the Properties button.
7. Set your IP options and click OK. On the register side you will want to setup the register with the same subnet mask and gateway, but a different IP address. In this example, 192.168.0.211 would be a good choice for ease of use.


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 000 . 210
Subnet mask: 255 . 255 . 255 . 0
Default gateway: 192 . 168 . 000 . 001
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

Hint #5 TCP/IP cabling
Please read Hint #3 and #4. In general a standard network cable can be used in a LAN scenario. If the connection is directly between the register and the PC, a crossover should be utilized.

Hint #6 Power the register on and off
After any S Mode edits, please power the register on and off for those settings to take affect.

Hint #7 Virus software and firewall
Please make sure Version 7 Polling and CalendarPoll have been added to the exception list of your virus software and firewall. One troubleshooting trick would be to temporarily disable virus and firewall protection in order to conduct a test. This should be a temporary change. Please consult your IT administrator before making these changes.

Hint #8 IRC communications
Version 7 Polling supports polling of satellite registers through the use of register numbers for both TCP/IP and serial communications. From within a reporting screen, users can select which registers they wish to poll. For example, within a 2 register IRC, users may poll a report from 1-1, 2-2, or 1-2.

The software also supports program downloads to select registers. The only caveat to this operation is that the master terminal will receive all program downloads. Thus with a 3 register IRC, users may send programming changes only to register 3, but the master terminal will also receive those changes. To use this option, please select the Use Other Reg Range for Send option within S Mode programming on the software. For more information please contact PC/POLL support. (By default, the software is configured to send all programming changes to all registers within an IRC.)

With TCP/IP communications, users can talk directly with any register within the IRC using that register's IP address. However, it is still recommended, for simplicity of use, to communicate **directly to the master terminal** and then request data from the satellite registers via the register range option on the reporting selection screen. Please review sample software screens below.

Below is a sample report screen and the S Mode program broadcast option screen.